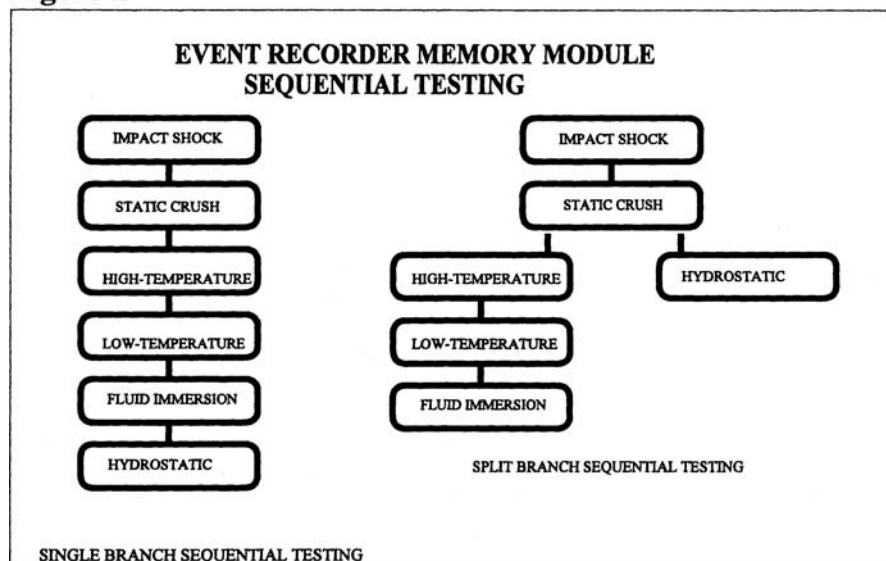


tests are done in the set sequence (single branch testing), the same ERMM must be utilized throughout. If a manufacturer opts for split branch testing, each branch of the test must be conducted using an ERMM of the same design type as used for the other

branch. Both alternatives are deemed equivalent, and the choice of single branch testing or split branch testing may be determined by the party representing that the ERMM meets the standard.

**Figure 1**



#### E. TESTING EXCEPTION

If a new model ERMM represents an evolution or upgrade from an older model ERMM that was previously tested and certified as meeting the performance criteria contained in Section C of this appendix, the new model ERMM need only be tested for compliance with those performance criteria contained in Section C of this appendix that are potentially affected by the upgrade or modification. FRA will consider a performance criterion not to be potentially affected if a preliminary engineering analysis or other pertinent data establishes that the modification or upgrade will not change the performance of the older model ERMM against the performance criterion in question. The manufacturer shall retain and make available to FRA upon request any analysis or data relied upon to satisfy the requirements of this paragraph to sustain an exception from testing.

[70 FR 37942, June 30, 2005]

#### APPENDIX E TO PART 229—PERFORMANCE CRITERIA FOR LOCOMOTIVE CRASH- WORTHINESS

This appendix provides performance criteria for the crashworthiness evaluation of alternative locomotive designs, and design standards for wide-nosed locomotives and any for other locomotive, except monocoque/semi-monocoque design locomotives and narrow-nose design locomotives. Each of the following criteria describes a collision scenario and a given performance measure for protection provided to cab occupants, normally through structural design. Demonstration that these performance criteria have been satisfied may be accomplished through any of the methods described in §229.205. This performance criteria is intended to prevent intrusion into the cab seating area occupied by crews. This excludes inner and outer vestibule areas.

(a) *Front end structure (collision posts)*—(1) *Objective.* The front end structure of the locomotive must withstand a frontal impact

with a proxy object which is intended to simulate lading carried by a heavy highway vehicle (see figure 1).

(2) *Proxy object characteristics and orientation.* The proxy object must have the following characteristics: Cylindrical shape; 48-inch diameter; 126-inch length; 65,000 pound minimum weight; and uniform density. The longitudinal axis of the proxy object must be oriented horizontally perpendicular to the longitudinal axis of the locomotive.

(3) *Impact and result.* The front end structure of the locomotive must withstand a 30-mph impact with the proxy object resulting in no more than 24 inches of crush along the longitudinal axis of the locomotive, measured from the foremost point on the collision post, and with no more than 12 inches of intrusion into the cab. The center of impact must be 30 inches above the top of the locomotive underframe along the longitudinal centerline of the locomotive.

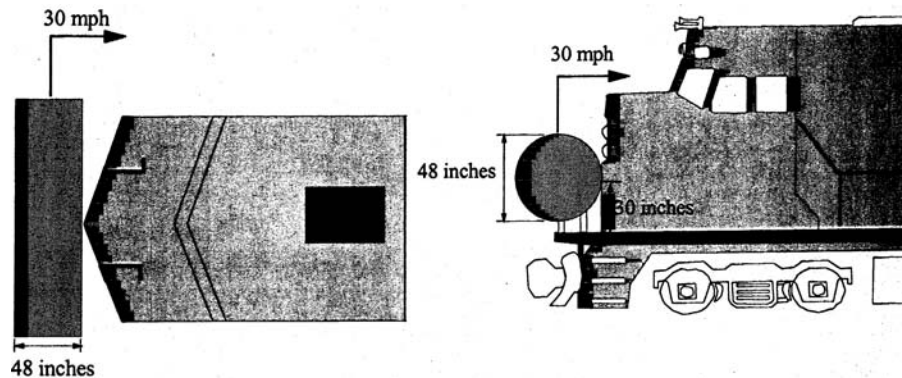


Figure 1. Schematic of Front End Structure (Collision Posts) Impact

(b) *Front end structure (short hood) (1) Objective.* The front end structure of the locomotive must withstand an oblique impact with a proxy object intended to simulate an intermodal container offset from a freight car on an adjacent parallel track (see figure 2).

(2) *Proxy object characteristics and orientation.* The proxy object must have the following characteristics: Block shape; 36-inch width; 60-inch height; 108-inch length; corners having 3-inch radii corners; 65,000 pound

minimum weight; and uniform density. The longitudinal axis of the proxy object must be oriented parallel to the longitudinal axis of the locomotive. At impact, the proxy object must be oriented such that there are 12 inches of lateral overlap and 30 inches from the bottom of the proxy object to the top of the locomotive underframe.

(3) *Impact and results.* The front end structure of the locomotive must withstand a 30-mph impact with the proxy object resulting in no more than 60 inches of crush along the

longitudinal axis of the locomotive, measured from the first point of contact on the

short hood post, and with no more than 12 inches of intrusion into the cab.

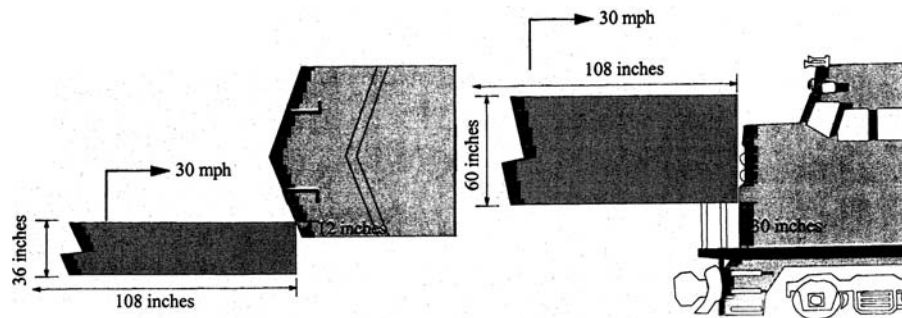


Figure 2. Schematic of Front End Structure (Short Hood) Offset Impact

[71 FR 36915, June 28, 2006]

#### APPENDIXES F-G TO PART 229 [RESERVED]

#### APPENDIX H TO PART 229—STATIC NOISE TEST PROTOCOLS—IN-CAB STATIC

This appendix prescribes the procedures for the in-cab static measurements of locomotives.

##### I. MEASUREMENT INSTRUMENTATION

The instrumentation used should conform to the following: An integrating-averaging sound level meter shall meet all the requirements of ANSI S1.43-1997 (Reaffirmed 2002), "Specifications for Integrating-Averaging Sound Level Meters," for a Type 1 Instrument. In the event that a Type 1 instrument is not available, the measurements may be conducted with a Type 2 instrument. The acoustic calibrator shall meet the requirement of the ANSI S1.40-1984 (Reaffirmed 2001), "Specification for Acoustical Cali-

brators." The Director of the Federal Register approves the incorporation by reference of ANSI S1.43-1997 (Reaffirmed 2002) and ANSI S1.40-1984 (Reaffirmed 2001) in this section in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy of the incorporated standards from the American National Standards Institute at 1819 L Street, NW., Washington, DC 20036 or <http://www.ansi.org>. You may inspect a copy of the incorporated standards at the Federal Railroad Administration, Docket Room, 1200 New Jersey Avenue, SE., Washington, DC 20950, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html)

##### II. TEST SITE REQUIREMENTS

The test site shall meet the following requirements: